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CENTRAL FAX CENTER****MAY 11 2007****REMARKS**

Applicant has carefully considered the rejection in the previous office action and submits the following response. In the present response, claims 10-11 are amended and new claims 12-28 are added. The amendments add no new matter, and are believed to place the application in condition for allowance.

**Drawing**

The examiner contends that the subject matter of the application admits of illustration by a drawing to facilitate understanding of the invention. The examiner required that applicant furnish a drawing. Applicant submits herewith a New Sheet comprising Figure 1 and Figure 2. The New Sheet does not add new matter. Applicant respectfully requests entry of the New Sheet.

**Rejection Under 35 U.S.C. § 103**

The examiner rejected claims 1-11 as obvious over Suppes et al (Compression-Ignition Fuel Properties of Fischer-Tropsch Syncrude, Ind. Eng. Chem. Res. 1998, 37 2029-2038) in view of US004764266 (Chen et al) and US03810732 (Koch).

The examiner contends that Suppes: "discloses burning light Fischer-Tropsch fuels or Syncrude" (citing page 2030, col. 1, ll. 27-36); "in combustion apparatus such as internal combustion engines, as a suitable alternative to diesel and gasoline fuels" (citing p. 2031, col. 2, ll. 4-35); "in for example conventional diesel engines." Office Action, p. 2. The examiner points to a variety of characteristics of "known light Fischer-Tropsch fuels," including "a boiling point of 170.6-314.9 °C (Table 1)." Office Action, p. 2-3. The examiner also takes "Official Notice" that "it is well known to burn heating oil in combustion apparatus associated with superheated steam boiler apparatus, and to use steam produced therefrom to power piston or expansion engines." Office Action, p. 2.

The examiner contends that:

it would have been obvious to a person having ordinary skill in the art to operate steam heating system burners with Fischer-Tropsch fuel having additives and low aromatic and sulfur content and a density similar to that of home heating fuels (i.e. - between 0.65 and 0.8 g/cm<sup>3</sup> at 15 °C), in view of the teaching of . . . US004764266 (Chen et al).

Office action, page 3. With respect to providing a suitable burner for combusting "room temperature liquid fuel," the examiner contends that:

it would have been obvious to a person having ordinary skill in the art to evaporate liquid hydrocarbon droplets to obtain[] a gaseous mixture and thereafter combust the mixture in a porous catalyst, which inherently produces an aerodynamically stabilized radiant flame, in view of the teaching of US0380732 (Koch)

Office action, page 3. The examiner also takes "Official Notice" that "ionization type sensors are well known means for detecting flames," and contends that, "in view of that which is well known and for the known purpose, it would have been obvious to a person having ordinary skill in the art to detect the flame of a heating system burner." Office action, pp. 3-4.

### Response

The examiner has the burden to establish a *prima facie* case of unpatentability of the pending claims on any grounds, including obviousness. *In re Oetiker*, 24 U.S.P.Q.2d 1443 (Fed. Cir. 1992). If examination at the initial stage does not produce a *prima facie* case of unpatentability, then without more, the applicant is entitled to grant of the patent. *In re Oetiker*, 24 U.S.P.Q.2d 1443. In order to establish that the claims are *prima facie* obvious over the cited references, the Examiner must point to two things in the cited references, and not in the Applicants' disclosure: (1) the suggestion of the invention, and (2) the expectation of its success. *In re Vaeck*, 20 U.S.P.Q.2d 1438, 1442 (Fed. Cir. 1991).

The examiner has not pointed to a teaching or suggestion in any of the cited references to "subject[ a] liquid Fischer-Tropsch derived hydrocarbon fuel [or a droplet mixture thereof] to a cool flame . . . having a temperature of between 300 °C. and 480 °C when the pressure is 1 bar." The examiner therefore has not

pointed to known elements in the references which can be combined in the fashion of the pending claims. In other words, the examiner has not pointed to a teaching or suggestion of the invention in the cited references. *In re Vaeck*, 20 U.S.P.Q.2d at 1442. The examiner has not established that the claims are directed merely to "the predictable use of prior art elements according to their established functions." *Id.*, slip op. p. 13 (emphasis added).

The examiner contends that he has established a case of *prima facie* obviousness based on a combination of references. As recently observed by the United States Supreme Court ("Supreme Court"), "inventions in most, if not all, instances rely upon building blocks long since uncovered, and claimed discoveries almost of necessity will be combinations of what, in some sense, is already known." *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. \_\_\_\_ (2007), slip op. 15. For this reason, "[a] patent composed of several elements is not proved obvious merely by demonstrating that each of its elements was, *independently*, known in the prior art." *Id.*, slip op. at 14 (emphasis added). Where the examiner relies on a combination of references, the examiner must establish an apparent reason to combine known elements in the fashion claimed. *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. \_\_\_\_ (2007), slip op. 14.

Even if the examiner had demonstrated that every element of the claims was known in the prior art--which Applicant expressly denies-- the examiner has not established "an apparent reason to combine [] known elements in the fashion claimed by the patent at issue." *Id.*, slip op. at 14. More specifically, the examiner has not established an apparent reason to "subject[ a] liquid Fischer-Tropsch derived hydrocarbon fuel [or a droplet mixture thereof] to a cool flame . . . having a temperature of between 300 °C. and 480 °C when the pressure is 1 bar." The examiner has not established an apparent reason to combust an evaporated gaseous mixture which has been prepared by subjecting a liquid Fischer-Tropsch derived hydrocarbon fuel to such a cool flame. Nor has the examiner established an apparent reason to perform the foregoing in combination with all of the other features in the dependent claims. *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. at slip op. 14.

**-Suppes**

The examiner cites Suppes as the primary reference. Suppes is directed to the evaluation of "cetane number, viscosity, cloud-point, and pour-point properties of syncrude and blends of syncrude with blend stocks such as ethanol and diethyl ether." Suppes, abstract at 2029 (emphasis added). According to Suppes "blends comprised primarily of syncrude are **potentially good CI [Compression-Ignition] fuels**, with pour-point temperature depression being the largest development obstacle." *Id.* Suppes states that "fuels based on >70% Fischer-Tropsch syncrude ... would fill an important niche in the EPACT [U.S. Environmental Policy Act] fuel menu, namely, an affordable **liquid fuel that can be used in conventional diesel engines**" that "generally have high cetane numbers (>65) and near-zero aromatic contents," Suppes (column 2, second full paragraph at page 2031, emphasis added).

The examiner has not established that Suppes describes "subject[ing a] **liquid Fischer-Tropsch derived hydrocarbon fuel [or a droplet mixture thereof] to a cool flame . . . having a temperature of between 300 °C. and 480 °C when the pressure is 1 bar.**" The examiner also has not established that Suppes describes combusting an evaporated gaseous mixture which has been prepared by subjecting a liquid Fischer-Tropsch derived hydrocarbon fuel to such a cool flame. Nor has the examiner established that Suppes teaches performing the foregoing in combination with all of the other features in the dependent claims. *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. at slip op. 14.

The examiner apparently relies on Chen and Koch to provide an apparent reason to perform the foregoing operations.

**-The secondary references****-US004764266 to Chen et al ("Chen")**

Chen describes

[a]n integrated refining scheme for hydroprocessing high boiling fractions such as gas oil and catalytically cracked cycle oils to produce premium quality distillates, especially jet fuels and naphthas suitable for reforming into high octane gasoline. In addition, unconverted, high boiling fractions

suitable for processing by conventional refining techniques into high quality, low pour point lube base stocks are obtained.

Chen, abstract. Chen states that

The feedstocks which are employed in the present process may be generally characterized as high boiling point feeds of petroleum origin although feeds of other origin may also be employed, for example, feeds from synthetic oil production processes such as Fischer-Tropsch synthesis or other synthetic processes, e.g. methanol conversion processes.

Chen, col. 6, ll. 17-23.

However, the examiner has not established that Chen describes "subject[ing a] liquid Fischer-Tropsch derived hydrocarbon fuel [or a droplet mixture thereof] to a cool flame . . . having a temperature of between 300 °C. and 480 °C when the pressure is 1 bar." Nor has the examiner established that Chen describes combusting an evaporated gaseous mixture so produced for any particular reason. The examiner has not established that Chen provides "an apparent reason to combine [] known elements in the fashion claimed by the patent at issue. *Id.*, slip op. at 14."

The examiner has not established a case of *prima facie* obviousness of the pending claims over Suppes in view of Chen.

**-U.S. Patent No. 3,810,732 to Koch ("Koch")**

Koch is directed to "a method and apparatus for the flameless combustion of gaseous or vaporous fuel-air mixtures passing through a burner which has at least one perforated sintered block." Koch, col. 1, ll. 7-10. Koch describes fuels which may be used in the method and apparatus as follows:

gasoline as well as oil may be used as fuel. The fuel may be in the form of light gasoline and light oil, as well as in the form of heavy gasoline and heavy oil. Moreover, waste gasoline and waste oil may be used. Other liquid hydrocarbon mixtures or individual hydrocarbons such as benzene, and also gaseous fuels such as city gas, natural gas, methane or propane may be used. In general, carbon-containing fuels such as for instance, blast-furnace gas that contains carbon monoxide may be used in the method of the invention, however, fuels containing hydrocarbons are preferred.

Koch, col. 4, l. 61-col. 5, l. 5.

The examiner has not established that Koch provides an apparent reason to use a Fischer Tropsch derived hydrocarbon fuel in Koch's method and apparatus. The examiner certainly has not established that Koch provides an apparent reason to "subject[ a] liquid Fischer-Tropsch derived hydrocarbon fuel [or a droplet mixture thereof] to a cool flame . . . having a temperature of between 300 °C. and 480 °C when the pressure is 1 bar." Nor has the examiner established that Koch provides an apparent reason to combust an evaporated gaseous mixture so produced for any particular reason.

In fact, Koch explains that, "[s]urprisingly, it has been found that at a definite temperature, which the entire perforated sintered block must have, namely, approximately 950 °C, flameless combustion takes place in the perforated sintered block, such as has been known heretofore only in catalyst-containing perforated sintered blocks." Koch, col. 1, ll. 59-65. In Koch's process, "the fuel-air mixture after ignition first burns at the front or entrance surface of the perforated sintered block. When the latter has reached the reaction temperature, about 950 °C, which can be recognized by its bright red color, the flow rate of the fuel-air mixture is increased and the flame is pushed into the perforated sintered block." Koch, col. 2, ll. 1-7.

The foregoing description in Koch arguably teaches away from the claimed method, in which combustion occurs after the fuel is subjected to a *cool flame* "having a temperature of *between 300 °C. and 480 °C* when the pressure is 1 bar." Claims, emphasis added.

The examiner has not established that Koch provides an apparent reason to subject a liquid Fischer-Tropsch derived hydrocarbon fuel [or a droplet mixture thereof] to a cool flame . . . having a temperature of between 300 °C. and 480 °C when the pressure is 1 bar." The examiner has not established that Koch provides an apparent reason to combust an evaporated gaseous mixture produced by the foregoing process. The examiner also has not established that Koch provides an apparent reason to perform the foregoing in combination with all

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of the other features in the dependent claims. *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. at slip op. 14.

For all of the foregoing reasons, the examiner has not established a case of *prima facie* obviousness of the pending claims over Suppes in view of Chen and/or Koch.

### CONCLUSION

Applicant respectfully requests entry of the amendments, withdrawal of the rejection, and allowance of all of the pending claims. The Commissioner is hereby authorized to charge any fee in connection with this paper to Deposit Account No. 19-1800 (File no. T8576), maintained by Shell Oil Company.

Respectfully submitted,

  
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